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Circular WEEEP

WEEE lives Solutions
Key experiences

Version 1

12 2025

Below is a concise analysis on experiences and recommendations from implementing the WEEE Lives pilot action under Circular WEEEP (Deliverable D.2.2.1.) — **what worked, what to watch out for.**

WHAT WORKED

- **Engaging schools proved effective**: Targets exceed.
  5 schools Lublin (PP10 as co-leader); 7 schools Rogaška Slatina (PP3 as co-leader) + CPU (PP4 as leader)
  78 schools overall (PL, SI, SK, CZ).
- **The campaign mobilized significant quantities of e-waste**: the pilot collected ~ 20 tons overall (PL, SI, SK, CZ).
  1,232 t in Lublin (PP10 as co-leader); 1,654 t in Rogaška Slatina (PP3 as co-leader) + CPU Slovenske Konjice (PPP4 as leader)
- The combination of collection + education + practical skills **helped embed circular-economy values early on** — a strong basis for long-term behavioral change. (Based on schools' feedback)
- Using "repair café", visits to REUSE/Waste collection centers, and practical workshops made **reuse/repair more tangible, not just abstract.**

KEY RISKS AND WHAT TO WATCH OUT FOR

- **Need for clear governance and stakeholders' coordination**: Since the pilot involves schools, collection/reuse centres, municipalities and possibly private partners, clear roles/responsibilities are needed (who collects, transports, stores, assesses, repairs). Without strong coordination, items may fall through the cracks.
- **Collection infrastructure:** Ensure uniform and sufficiently large collection containers in schools with clear markings of what belongs in them.

  To avoid the loss of potentially reusable EEE, **a standardized triage protocol** is recommended for all collection sites. This protocol enables early classification of devices into categories such as *functional*, *repairable*, or *suitable for parts recovery*.

  The pilot needs clear criteria for reuse vs recycling, and a realistic assessment of what portion of collected waste can meaningfully be given a "second life."

• **Monitoring:** Monitoring must be simple and consistent to evaluate and report results — e.g., a shared spreadsheet or centralized platform for all stakeholders, periodic updates, and a designated person responsible.
• **Engagement / motivation**: Relying on schools, parents and volunteers (students, teachers) can lead to uneven participation or drop-off if incentives or communication fade. Ensuring continuous motivation (e.g. via rewards, public recognition) helps, but this requires resources and planning.
• **Legal framework surrounding e-waste management limiting repair & reuse:** In Lublin, current regulations classify collected e-waste as waste, prohibiting repair and reuse for second life applications.

As the lead partner of the WEEE Lives pilot project, CPU further shares its experience from the WEEE Lives pilot action implemented in Rogaška Slatina and Slovenske Konjice, Slovenia.

What we would do differently if implementing the pilot action again:

- **Community involvement:** Ask schools to inform parents early through multiple channels — Publication on their site, flyers in school bags, WhatsApp groups, or parent meetings.
- **Collection place:** Provide a collection area or infrastructure, where the e-waste could be collected anytime during the campaign (outside of schools opening hours).
- **Communication and impact**: Publish interim results to keep motivation and present the impact of the collection – e.g. how much CO_2 was saved.

What we plan to continue implementing and the approaches that have proven effective.

- **Provide ready-to-use educational materials:** Support teachers with ready-to-use classroom activities, short educational videos or presentations about e-waste.

The development of educational materials, such as worksheets, proved effective in fostering a better understanding of circular economy principles and e-waste among pupils.

- **Provide practical workshops:** CPU integrates hands-on learning during the school visits to raise awareness about electronic waste.

Activities like dismantling small devices and basic repair not only engage pupils but also promote a culture of reuse and sustainability.

Practical Findings and Lessons Applied

The WEEE Lives pilot showed that **combining collection with hands-on education significantly increases both awareness and recovery of small electronic waste, especially forgotten small electronics like phones, cables, and gadgets.**

The role of recycling centers and waste management companies is crucial to the success of the initiative. **Their involvement ensures that collected e-waste is processed responsibly, highlighting the importance of such partnerships in community-driven actions.**

Collaboration with local reuse centres enabled more **efficient repair assessments and strengthened circular practices**. CPU strengthened its collaboration with the waste management companies in the communities of Rogaška Slatina and Slovenske Konjice during school visits.

Proposal of Solutions derived from WEEE lives pilot implementation experience

Based on the insights gained during the implementation of the WEEE lives pilot action, a proposal of solutions has been developed to enhance the reuse and second-life potential of devices which had been discarded as WEEE by organizing e-waste competition in schools.

The WEEE lives pilot demonstrated that effective reuse requires coordinated engagement among schools, recycling centers, NGOs, waste management companies, repair actors, and final beneficiaries.

This proposed solution builds directly on the practical experiences and challenges identified during the pilot action. **It includes indications of the actions and resources needed for it to be taken up or to be up-scaled.**

PROPOSAL OF SOLUTIONS DERIVED FROM WEEE LIVES PILOT IMPLEMENTATION EXPERIENCE:

Actions & Resources

A. Stakeholder Roles and Coordination

Clear Stakeholder Roles

- **Actions:** Agree on responsibilities between schools, municipalities, waste collectors, and reuse centres through brief cooperation agreements.
- **Resources:** Rules and role-sharing document, contact list, periodic coordination meetings.

B. Enhanced Collection Infrastructure

School-Based WEEE Micro Collection Points

- **Actions:** Install small collection boxes and secure temporary storage space in schools; run short awareness sessions or educational displays; schedule regular pick-ups.
- **Resources:** Collection containers, simple posters, contact person in each school, transport support from waste operators.

Easy Sorting Criteria for WEEE

- **Actions**: Provide simple guidance to categorize items as reusable, repairable, or recyclable; share examples and quick-check lists.
- **Resources**: One-page sorting guideline, support from waste and reuse operators for assessment.

C. Monitoring & Feedback System

Light Monitoring & Feedback System

- **Actions:** Use a shared spreadsheet or centralized platform for all stakeholders to track quantities collected, workshop attendance, repair outcomes, and feedbacks.
- **Resources:** Basic digital tools (Google Forms/Excel), a designated coordinator to compile data, short reporting templates.

D. Schools Engagement / motivation

Participation Incentives

- **Actions:** Publish interim results can increase motivation to carry out the action; offer certificates, public recognition, or small rewards to motivate engagement.
- **Resources:** Digital badges or certificates, communication materials, small non-monetary prizes (e.g., school supplies).

Repair & Reuse workshops

- **Actions:** Organize hands-on sessions where pupils learn to assess, repair, and safely dismantle devices; partnership with repair professionals or local repair cafés and reuse centres.
- **Resources:** Workshop space, trainers/technicians, basic tools (screwdrivers, testers), selected WEEE items for learning.

Integration of "Repair & Reuse Academies" in Schools

Establishing **Repair & Reuse Academies** — supported by repair professionals, reuse centres and NGO partners — would provide students with hands-on experience in diagnostics and repair, while ensuring a consistent flow of refurbished devices. This contributes to long-term capacity building and awareness of circular economy principles.

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Project Acronym

WEEE COLLECT /MARKET PILOT SOLUTIONS

Experience and Reccomendations from the Implementation of Circular WEEEP

Version 1

MM YYYY

Pilot Actions WEEE COLLECT and WEEE MARKET - Critical Analysis, Lessons Learned and Foundations for Capitalization

Introduction

The two pilot actions WEEE COLLECT and WEEE MARKET, implemented within the Circular WEEEP project, represent a significant learning experience for understanding how to implement transnational digital platforms in the electronic waste management sector. Developed by **ASSO** (responsible for platform development) and promoted by **PoR** (responsible for dissemination), the two pilots provided an in-depth learning opportunity regarding the tensions between project ambitions and operational feasibility, between localization and transnational standardization, and between theoretical models of circularity and consolidated market dynamics.

This report documents the contradictions identified between the application form objectives and implementation practice, not to highlight failures, but to **extract valuable lessons for future capitalization projects**, clearly identifying which directions have been successfully pursued, which unexpected convergences have emerged, and which assumptions require fundamental revision in the design of digital platforms for transnational WEEE management.

1. Fundamental Contradictions Identified in the Application Form: Lessons for Future Projects

1.1 Tension between Internationalization and Excessive Localization

The application form explicitly requires that the platform be **"promoted at Central Europe level, displayed in several languages, in an easy and intuitive way"**, with the objective of creating a **transnational WEEE collection online system that would coordinate collection logistics in a cross-border manner**. However, dissemination objectives and engagement metrics were defined with primary reference to an Italian audience and, specifically, the Rimini province.

Lesson learned: In future application forms for transnational platforms, the **localization model** selected must be explicitly stated: simple multilingualism does not create effective transnationality. An architecture serving primarily a local territory (Rimini) but displayed in English for international appeal risks creating confusion about who the true target audience is.

1.2 Ambiguity Regarding International Target and Primary Audience

The application form does not clearly specify: - Whether the primary target was truly international or whether internationality was merely secondary framing - How to balance depth of local information (essential for practical utility) with the need for international appeal - Which parts of the platform should be localized and which should remain transnational

This gap forced implementation partners to make ex-post decisions (such as opening a Czech section) not provided for in the original specifications, yet it also enabled the consortium to empirically identify the correct solution.

This experience of pragmatic adaptation holds value for future projects: **the need to provide, in initial design planning, a certain degree of architectural flexibility and a platform evolution roadmap**, rather than crystallizing objectives in a single version at launch.

2. Implementation Problems Identified: Divergences between Assumptions and Operational Reality

2.1 Redundancy with Pre-existing Local Infrastructure: How to Transform a Constraint into Opportunity

A critical element not immediately apparent from the application form is the pre-existence of already consolidated and highly evolved digital solutions at local level. In the Rimini province, **Hera has developed and maintains "Rifiutologo"**, an extremely sophisticated geolocalized mobile application that allows citizens to locate in real time differentiated waste collection centers, book pickups, and obtain detailed information on correct waste disposals for each waste type.

This situation creates an **apparent pragmatic contradiction**: the local population of Rimini would hardly benefit from a WEEE COLLECT platform that replicated functionality already available in a more evolved and consolidated version.

Yet the consortium transformed this constraint into a higher-value opportunity: the solution actually implemented—to develop the platform primarily in English—represents a pragmatic strategic inversion that revealed the true and higher-value target of the solution. Internationalization transformed the project from "local duplicate" to **transnational replicable model**, demonstrating to local authorities, cities, and Czech partners how to systematically implement a structured, scalable digital WEEE collection solution easily adaptable to local context.

The visualization and engagement numbers achieved (which exceeded application form targets) do not derive primarily from Italian audiences (already served by alternative local solutions) but rather from **international traffic genuinely interested in understanding how to develop similar solutions in their own areas of competence**.

For capitalization: future projects should recognize that the existence of consolidated local infrastructure does not invalidate the relevance of a project solution; rather, it requalifies the target from local citizens to policy decision-makers and city administrators seeking best-practice models to replicate.

2.2 Relational Dynamics with Local Operators: The Necessity of Timely Co-design

The language choice created a significant challenge in terms of **dissemination and local synergy (primary responsibility of PoR)**. In the Italian version of the platform, the **local waste management company (Hera) perceived the CWEEP solution as a duplicate and even direct competitor** to its already consolidated application.

PoR faced significant difficulties in creating synergies with the main local operator, who viewed the CWEEP platform not as complementary but as potentially harmful to its investments and market position.

Lesson learned and recommendation for future projects: The absence of timely formal involvement of local waste management operators in the co-design phase generated a perceived competition dynamic. **In future projects, it is essential to conduct a structured preliminary consultation phase with sector**

operators to identify how the platform can integrate and create added value rather than compete with already consolidated systems.

2.3 Economic and Operational Sustainability Assumptions: The Gap between Project Ambition and Feasibility

The application form requires that the platform facilitate **"on-demand WEEE collection"** (on-demand collection), presupposing that the local waste management company would implement ad-hoc logistics services. **This assumption proved economically and logistically unsustainable** for an operator like Hera for structural reasons:

1. **Economic incompatibility**: On-demand collection would entail significant logistics costs for pickups often of small WEEE quantities, with non-existent or negative economic margins.
2. **Disruption of consolidated processes**: Hera manages waste collection through processes optimized over years (fixed centers, pre-established collection days, planned logistics routes). Inserting an on-demand system would require deep operational redefinition.
3. **Absence of economic incentive**: The application form does not specify financing mechanisms to cover additional collection costs, nor does it provide economic margins for the operator.
4. **Lack of formal involvement**: Hera was not a formal project partner but an external entity being asked (implicitly) to adopt costly procedures.

Fundamental lesson for capitalization: It is not possible to require in an application form that local economic actors (non-formal partners) transform consolidated processes in conformity to theoretical sustainability visions generated at project level, without providing direct economic incentives or parity involvement in co-design. The distinction between binding requirements for formal consortium partners and recommendations/coordination opportunities with external subjects must be explicit in the application form.

2.4 Unrealistic Assumptions Regarding Market Dynamics and Necessary Pragmatic Adaptation

The WEEE MARKET component of the application form presupposed the creation of **an online marketplace where individual citizens or small operators purchase secondary raw materials directly from WEEE treatment plants**, according to a model stylized as "Amazon of circularity".

This assumption proved structurally unrealistic compared to the consolidated reality of European secondary raw materials markets:

1. **Fragmentation and absence of standardization**: European secondary raw materials markets (SRM) suffer from lack of technical standardization and end-of-waste criteria misalignment across countries. There is no "generic secondary raw material" sellable on a marketplace; each batch requires case-by-case assessment.
2. **Market liquidity shortages**: European research shows that **of secondary markets analyzed, only three (aluminum, paper, glass) are functioning**. Markets for components extracted from WEEE present extremely low liquidity.
3. **Supply chain complexity**: Secondary raw materials from WEEE follow structured B2B supply chains vertically integrated with large recycling companies, not dispersed.

4. **Economic and scale barriers**: Buyers of secondary raw materials require minimum quantities (typically tonnes), certifications, supply continuity—none compatible with spot transactions between citizens and plants.
5. **Absence of demand-side**: European Parliament and EEA research shows producer reluctance to invest in technologies integrating SRM in sourcing operations.

Facing these structural market constraints, the CWEEP consortium adopted a pragmatic approach significantly divergent from original specifications: rather than a B2C marketplace, the WEEE MARKET component was recalibrated as a **B2B supply-demand coordination platform**, facilitating contacts and negotiations between treatment plants and qualified buyers through matchmaking models.

This transformation is conceptually correct and represents adaptation necessary to operational reality. It highlights a failure in the requirements definition phase: the application form presupposed market dynamics that do not exist and cannot be created by a three-year Interreg project.

Yet this pragmatic adaptation also represents valuable learning: clearly distinguish between components enabling existing processes (achievable) and components transforming/creating new markets (unrealistic in short timeframes). **For capitalization**, this experience offers a **methodological framework for assessing feasibility of "market creation" components** in future application forms, validating assumptions ex-ante through direct consultation with consolidated operators.

2.5 Transnational Localization: Decentralized Responsibilities and Dedicated Financing for National Sections

A critical gap emerges regarding the creation and maintenance of localized national platform sections. As emerges from the **Lublin transnational meeting (September 2025)**, it was established that **each project partner (PP) would provide a national or local section clearly identifying local waste management provisions, measures and national laws governing WEEE management**, structured as mirror to the Italian section to avoid normative confusion and guarantee local applicability.

This solution is **conceptually correct and necessary for platform's effective transnationality**: without explicit national sections clarifying normative divergences between Italy, Czech Republic, Poland, Slovenia, Croatia, Austria and Slovakia, the platform remains an Italian tool hardly replicable.

Yet application form analysis reveals absence of clear specification regarding responsibility and resource allocation:

1. **Local development responsibility**: It must be explicitly established that **ASSO, as core platform developer, cannot be responsible for developing pages in local languages and specific national normative content**. ASSO can perform a **limited role in technical coordination and architectural compatibility validation**, but material resources directly working on the platform (translation, normative adaptation, local system integration, QA) must be **necessarily local resources of each national partner**, possessing language and territorial normative expertise.
2. **Explicit budget allocation**: It is unclear whether the AF provides dedicated budget lines for each partner to develop their own local sections, or whether the assumption was that each PP would absorb these costs as "in-kind contribution". This ambiguity is critical: localization is not an optional or accessory feature but an essential element of transnational project mission.
3. **Maintenance costs**: The AF does not address recurring costs to maintain sections updated against continuously evolving regulations.

Practical impact observed: Absence of explicit financing and clear roadmap probably determined delays in Czech section opening, implemented in later phase rather than at launch, and uneven quality among sections.

Lesson for capitalization: Transnational platforms require: - **Clear role distinction**: ASSO coordinates and validates; local resources develop and manage national sections - **Explicit and dedicated budget allocation** for each partner to develop their own local section, with sequential but coordinated launch timeline - This is an **essential project mission feature**, not "accessory"

3. Strategic Recommendations for Future Capitalization Projects

Based on analysis of contradictions identified and pragmatic adaptations realized by the CWEEP consortium, a set of methodological recommendations emerges for designing transnational digital platforms in the WEEE management sector:

3.1 Assessment Methodology Based on Feasibility Validation

In future application forms, include a **dedicated chapter on "market and operational feasibility analysis"** conducted in collaboration with: - Consolidated WEEE treatment operators - Qualified secondary raw materials buyers - Trade associations - National environmental agencies

This chapter must validate ex-ante that business models presupposed by the project are compatible with real sector functioning mechanisms, clearly distinguishing between: - **Enabling components**: existing processes that the platform facilitates (matching, traceability, coordination) - **Transformation components**: assumptions requiring significant changes in consolidated economic behaviors or processes

3.2 Architectural Separation between Local and Transnational Components

WEEE COLLECT (citizen-facing, heavily localized) and WEEE MARKET (B2B, transnational) should have **distinct architectures** with differentiated information taxonomies. This allows: - Adapting WEEE COLLECT to local normative specificities without compromising WEEE MARKET trading logic - Maintaining narrative clarity about which component serves which audience - Modulating engagement targets accordingly

3.3 Timely Co-design with Operational Stakeholders

Before finalizing the application form, conduct a structured consultation phase with: - Local waste management operators (like Hera in Rimini) - Testing partners (like CTU for Czech Republic) - Potential secondary raw materials buyers and sellers

This phase must identify how the platform can integrate with consolidated local infrastructure, which requirements are truly implementable, and what real incentives exist for operator adoption.

3.4 Explicit Transnational Governance and Structured Feedback Loop

Define pre-project: - **Decision-making roles**: How and where platform decisions are made at consortium level - **Test feedback**: Formal mechanisms through which testing partners (like CTU) report incongruences

between platform design and local realities - **Development iteration**: Processes enabling timely corrections rather than post-launch recalibration

3.5 Explicit Budget and Timeline for National Localization

For transnational applications, allocate in budget: - **Dedicated line items for each PP** for developing their own local section, including normative consultation, technical development (local system integration) and QA

- **Explicit timeline**: when each national section must be operational (e.g., Italian + Czech section at M12, Poland and Slovenia sections at M18)
- **Clear responsibilities**: explicit assignment of which partner is responsible for developing, validating and maintaining each section, with ASSO in coordination and architectural validation role, not direct execution

4. Structural Problems Identified and Their Sustainability Implications

4.1 Absence of Structured Feedback Loop from Testing Partners

Czech Republic (through CTU) tested the platform, yet no formal evidence emerges of: - Structured process for reporting difficulties encountered - Feedback mechanisms allowing CTU to report incongruences between design and local realities - Bidirectional communication enabling development improvements during coding

Lesson learned: Testing processes must be integrated in a **formal and timely feedback loop** permitting testers to influence design during development, not merely validate finished product. This maximizes testing phase value as co-design tool rather than simple quality control.

4.2 Fundamental Contradiction between Project's Temporal Nature and Permanent Sustainability Expectations

A critical theme emerging during implementation concerns the tension between **project's temporal nature** and **implicit expectation of post-project sustainability**.

By consolidated Project Management definition, **a project is a "temporary endeavour" with defined beginning and end**. Contrasted with this, an **operation is a recurring activity without defined termination**. The distinction is critical:

- **Project budget**: allocated for temporary endeavour (2023-2026 in CWEEP case), necessary and sufficient to achieve objectives within temporal duration
- **Operation budget**: allocated recurrently, to sustain post-project continuous activities

CWEEP's application form contains an implicit contradiction: it requires digital platform development (temporal), yet generates expectations that the platform be maintained, updated and managed indefinitely post-project (recurring operation).

This contradiction:

1. **Violates project definition itself**: a temporary endeavour cannot generate infinite maintenance obligations based on budget allocated for the temporary endeavour
2. **Creates conflict with partner-funder agreements**: budget was allocated for temporary endeavour, not post-project operations. Demanding permanent maintenance means asking partners to "donate" resources indefinitely
3. **Is not resolved in the AF**, which does not specify:
    a. Whether the platform is a "deliverable" (like a report) delivered at project end or a permanent operating infrastructure
    b. Who has post-project responsibility and with which budget
4. **Is not even resolved as strategic position of Interreg Central Europe**: the program has not clarified whether digital platforms developed in funded projects should be treated as "disposable" or as permanent infrastructure requiring recurrent financing

This gap was highlighted by ASSO at the Prague kickoff meeting and remains unresolved both in the AF and as the program's position regarding management of transnational digital deliverables.

For capitalization projects, it is essential that an **explicit strategic decision** be made:

Option A (Temporary Deliverable): The platform is delivered at project end. Post-project responsibility is of external subjects (Local authorities, foundations) with separate financing.

Option B (Permanent Infrastructure): The platform is recognized as transnational public infrastructure. Interreg program (or other funders) must provide dedicated recurrent financing or identify "institutional custodians" (environmental agencies) responsible with ordinary budgets.

Without this clarification, future projects will continue containing the same governance contradiction.

4.3 Normative Incompatibility between Countries and Need for Differentiated National Sections

Italy and Czech Republic have: - Different **extended producer responsibility (EPR)** systems and different enforcement levels - Divergent regulations on collection procedures, treatment and WEEE end-of-waste criteria - Significantly different WEEE Consortium governance structures - Different reporting and traceability obligations

The solution identified at the Lublin meeting is appropriate: each PP should provide a **national section clearly identifying local provisions and measures**, structured as mirror to the Italian section. This guarantees parallelism with content reflecting each country's normative reality.

Yet this localization effort entails significant costs that must be explicitly allocated in budget and planned in timelines, with clear partner responsibilities and normative update mechanisms.

For capitalization: Localized national sections are **essential for effective transnationality**, not optional or accessory.

5. Summary and Capitalization Orientation

This report documents a project experience of significant value for the transnational WEEE waste management sector. The WEEE COLLECT and WEEE MARKET pilot actions represented a **"gymnasium" for empirically testing** what is achievable and what requires structural recalibration.

What has been learned and works: - Platform internationalization actually attracted transnational interest exceeding expectations, creating basis for replication in other contexts - Pragmatic adaptation toward B2B supply-demand coordination model aligned WEEE MARKET component with consolidated sector realities - Lublin meeting correctly identified mirrored national sections solution for transnational normative incompatibility challenge

What requires fundamental revision for future projects: - **Ex-ante validation of operational and market assumptions** through direct consolidated stakeholder consultation, not a priori assumption - **Explicit financing and budget allocation** for national localization components, with clear distinction between local execution and central coordination - **Timely co-design** with local operators and testing partners before application form finalization - **Transnational governance and structured feedback loops** enabling development adaptation, not post-launch recalibration only - **Resolution of contradiction between project's temporal nature and permanent sustainability expectations**, with explicit strategic decision (Option A: temporary deliverable with external post-project responsibility; Option B: permanent infrastructure with dedicated recurrent financing)

Capitalization orientation:

Future projects building on this experience should assume CWEEP as scientific and methodological learning base, clearly extrapolating:

- **What doesn't work and why**: unrealistic market creation assumptions, absence of operator co-design, implicit financing of critical components, post-project sustainability ambiguity
- **What works and under which conditions**: coordination and matchmaking platforms facilitating pre-existing supply-demand connections, mirrored national sections with dedicated financing and local responsibility, transnational target of policy-makers and city administrators rather than general citizens
- **Which promising directions to pursue**: integration with consolidated traceability systems, hybrid models leveraging public platforms to facilitate already consolidated market dynamics, transnational governance enabling local adaptation within common parameters

This report transforms CWEEP experience into a **valuable teaching resource** for the scientific and project community working on digital platforms for circularity, clearly identifying boundaries of what is realistic to pursue and which directions require recalibration to maximize success probability and sustainability in future capitalization projects.

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Circular WEEEP

FINAL REPORT
WEEE DESIGN Pilot Action

PI RERA SD

1. Introduction and Pilot Scope

The WEEE Design pilot action, led by RERA SD, was implemented within the framework of the Circular WEEEP project with the overarching aim of promoting circular economy principles in the design of electrical and electronic equipment (EEE). The pilot focused on improving eco-design practices, enhancing repairability and recyclability, and supporting better end-of-life management of EEE products in line with EU WEEE and Ecodesign policy objectives.

The pilot was developed and implemented in close cooperation with project partners, in particular BOKU, which contributed scientific expertise and developed assessment tools, and CTU, which supported methodological alignment and dissemination.

2. Objectives of the WEEE Design Pilot

The pilot pursued several interlinked objectives:

- Encourage manufacturers to design EEE products for easy dismantling and recycling
- Combat planned and functional obsolescence by supporting repairability and component reuse
- Promote adherence to eco-design directives and improved recycling labelling
- Foster awareness among companies and citizens about sustainable product design
- Support the collection of open technical data to enable repair, refurbishment, and second-life use

As defined in the project application, the pilot aimed to:

- Identify and contact more than 200 companies
- Involve 100 companies in awareness activities
- Carry out 20–30 company assessments
- Support redesign or documentation of more than 50 EEE products for improved circularity

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3. Methodology and Tools Developed

To operationalise the pilot objectives, RERA SD coordinated the development and deployment of two complementary tools, created by BOKU:

3.1 Questionnaire on Open Data for Producers

This questionnaire assessed companies' willingness and capacity to:

- Share technical specifications
- Provide repair and maintenance information
- Contribute to open databases supporting reuse and second life of EEE

The tool supported transparency and circular-economy principles by identifying realistic pathways for open technical documentation.

3.2 WEEE Design Evaluation Manual and Assessment Questionnaire

This assessment tool evaluated EEE design performance against key eco-design criteria, including:

- Ease of dismantling
- Material separability
- Recycling and labelling clarity
- Potential for reuse and second-life applications

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4. Implementation Phases and Results

Phase 1: Initial Outreach to Producers

Duration: Start of pilot – February 2025

RERA SD conducted direct outreach to EEE producers at national and EU level, introducing the WEEE Design pilot and inviting participation in the assessment process.

Key actions included:

- Distribution of the Open Data Questionnaire
- Direct contact via email, phone calls, and online meetings
- Initial piloting of the evaluation methodology with BOKU

Main challenge:
Producer engagement was significantly lower than expected. Many companies lacked internal resources or familiarity with eco-design and circular design concepts.

Mitigation measures:

- Launch of targeted awareness activities
- Cross-promotion with related initiatives (e.g. CIRCOTRONIC)
- Mobilisation of project partners to expand outreach in their respective countries

Phase 2: Educational and Awareness Campaign

Duration: March – May 2025

To strengthen engagement, RERA SD coordinated an awareness campaign targeting both companies and experts.

Key activity:

- Organisation of a public webinar titled "Sustainable Design and ESPR Compliance", addressing regulatory requirements and business benefits of circular design.

Results:

- Increased awareness and understanding of eco-design principles
- Improved stakeholder trust and visibility of the pilot
- However, conversion from awareness to completed assessments remained limited

Phase 3: Expanded Outreach to Wider Stakeholders

Duration: June – August 2025

Recognising the need to meet quantitative targets, RERA SD broadened the outreach to include:

- Repairers and refurbishers
- Recyclers and waste operators
- Designers and service providers
- Industry associations

Quantitative results:

- **1,300 emails** sent across the partnership
- **204 completed questionnaires** collected
- Overall response rate: **approx. 15.7%**

Critical limitation:
Only **38 respondents were actual EEE producers** (18.6% of total responses), which constrained the statistical robustness of the assessment results

5. Follow-Up Action: Circular EEE Design Assessment Tool

In the final stage of the pilot, and based on coordination with BOKU, a targeted follow-up action was implemented with companies that had already engaged.

Companies identified by BOKU) as EEE producers and product designers received the Circular EEE Design Assessment Tool.

Purpose of the Tool

The tool provides a structured self-assessment framework allowing producers and designers to:

- Evaluate environmental performance of their products
- Identify improvement opportunities in:
    - Energy efficiency
    - Material selection
    - Recyclability
    - End-of-life management
- Support informed and proactive eco-design decisions

This follow-up strengthened the qualitative impact of the pilot by offering practical, actionable guidance, even where large-scale empirical assessment was not feasible.

6. Key Challenges and Lessons Learned

Main Challenges

- Persistently low engagement from EEE producers
- Limited availability of internal company resources
- Difficulty obtaining product-specific design data

Lessons Learned

- Awareness activities are essential but not sufficient without incentives
- Designers, repairers, and refurbishers are highly relevant stakeholders for circular design
- Assessment tools must be simple, modular, and adaptable to real company practices

These insights are critical for future replication and scaling of similar pilot actions.

7. Outcomes, Added Value, and Transferability

Despite engagement challenges, the WEEE Design pilot delivered clear added value:

- Development and testing of eco-design assessment tools
- Engagement of over 200 stakeholders across the EEE value chain
- Improved awareness of circular design and ESPR obligations
- Direct follow-up support to identified producers and designers
- Contribution to the collection of open technical and repair documentation

The pilot provided practical evidence and lessons to inform future WEEE-related policies The pilot methodology and tools can be transferred and scaled in other regions, especially when combined with regulatory incentives or industry association involvement.and initiatives.

8. Conclusions and Recommendations

The WEEE Design pilot confirmed that circular design of EEE products remains a critical but underdeveloped area, particularly among producers. While quantitative targets were achieved in terms of outreach, qualitative engagement with manufacturers requires longer timeframes, incentives, and regulatory alignment.

Key Recommendations:

- Integrate eco-design assessments with regulatory or market incentives
- Strengthen collaboration with industry associations
- Focus on open repair documentation as a realistic entry point
- Continue refining assessment tools based on user feedback

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Pilot solutions

Social WEEEP

Version 1

12 2025

1. Identified Barriers and Challenges in Implementing the Social WEEE Pilot

1.1. Constraints Reported by Companies in the WEEE Sector:

- **Absence of Clear Cooperation Frameworks:** The lack of well-defined procedures for collaboration with Social Economy Entities (SEEs) creates uncertainty among companies regarding the formal and operational integration of these entities into existing processes. Consequently, businesses tend to adhere to established operational models, avoiding perceived risks associated with change.
- **Limited Awareness of SEE Capabilities:** Insufficient knowledge about the competencies of SEEs has led to doubts concerning their ability to ensure continuity of work and maintain quality standards. This uncertainty has raised concerns about potential reductions in service quality and increased costs related to supervision and oversight.
- **Legal Liability Concerns:** Companies engaged in WEEE recycling express apprehension about potential legal responsibility for errors occurring during dismantling or storage of equipment by individuals from vulnerable groups. These concerns further inhibit readiness to establish cooperative arrangements.

1.2. Barriers on the Side of Social Economy Entities (SEEs)

- **Technical and Infrastructure Deficiencies:** The absence of specialized equipment and adequate infrastructure significantly limits SEEs' ability to undertake activities that require compliance with standards for electrical waste processing. For many entities, this constitutes a financial and logistical barrier that cannot be overcome without external support.
- **Insufficient Knowledge of Regulatory Frameworks:** A lack of familiarity with regulations governing the WEEE market (including BDO registration, waste record-keeping, and classification requirements) has led SEEs to adopt a cautious approach and created uncertainty regarding their capacity to operate effectively in this sector.
- **Workforce Availability Challenges:** Many SEEs rely on employees with diverse needs or limited availability, which poses difficulties for companies that require stability and consistency in operational processes.

1.3. Legal and Regulatory Barriers

- **Highly Regulated Sector Requirements:** The WEEE sector is among the most heavily regulated areas of waste management, requiring partners to have detailed knowledge of procedures and to meet stringent standards. SEEs often lack the resources to comply with these requirements without advisory support.
- **Absence of Legal Framework for Delegation:** The lack of legal provisions enabling the delegation of specific tasks in the electrical waste processing chain to social

entities creates interpretative uncertainty, discouraging both parties from engaging in pilot cooperation initiatives.

1.4. Communication and Awareness Barriers

- **Low Awareness of "Social Recycling" Concept:** Limited understanding of the "social recycling" concept among WEEE companies resulted in the project being perceived primarily as a CSR initiative rather than a genuine opportunity to optimize operational processes.
- **Insufficient Strategic-Level Engagement:** In many cases, pilot contacts occurred at the operational level rather than with decision-makers capable of making strategic commitments, reducing the effectiveness of collaboration invitations.

1.5. Operational Barriers

- **Lack of Practical Testing:** The pilot did not include full-scale testing of models in practice, which meant that organizations could make declarations without demonstrating actual readiness for implementation. This hindered the ability to obtain a reliable picture of SEEs' real potential.
- **Absence of Standardized Cooperation Models:** The lack of ready-to-use, standardized collaboration frameworks and operational guidelines forced each company to independently consider how cooperation would work in practice, leading to decreased motivation to test new solutions.

2. Areas for Improvement During the Pilot Phase

2.1. Earlier Development of Operational Standards

Preparing a set of procedures, checklists, and process examples could have significantly increased companies' confidence, making it easier for them to envision practical implementation.

2.2. Provision of Industry-Specific Training for SEE

Training on BDO registration, safety standards, proper WEEE classification, and basic dismantling techniques would have enhanced SEEs' competencies and enabled their meaningful participation in electrical waste processing, paving the way for more advanced cooperation.

2.3. Greater Emphasis on Practical Piloting

(Not foreseen in the project due to lack of funding and implementation capacity by Bielsko District and ARR SA). Conducting even a few real-world tests based on actual logistical or dismantling processes would have increased the project's credibility and provided valuable data for subsequent implementation stages.

2.4. Improved Communication of Business Benefits

WEEE companies require strong economic arguments—highlighting cost reductions, compliance with ESG requirements, and reputational benefits could have resulted in higher engagement levels.

3. Recommendations and Future Guidelines

3.1. Joint Investment Projects:

There is a need for greater financial resources (not available under Interreg EC) and active involvement of WEEE sector partners and SEEs as genuine stakeholders. There is a need for establishing further legal and financial capacity to implement such specialized activities—universities may be better suited as coordinators, given their position between private companies and the social sector.

3.2. Funding for Technical Infrastructure:

Investments in technical infrastructure, workstations, and workshop equipment would enable SEEs to enter the WEEE market effectively, while helping companies reduce operational costs through social partnerships.

3.3. Promotion to benefit WEEE Companies:

Integrating SEEs into recycling activities can be leveraged in ESG reporting, which is increasingly important for modern enterprises and contributes to competitive advantage.

3.4. Development of Cooperation Models Based on Real Processes:

Creating several ready-to-use models—such as basic dismantling, equipment collection, and repair models—would allow companies to select solutions best suited to their operational profile. Given the complexity of this task, universities appear to be more effective actors for such initiatives for reasons outlined above.

4. Conclusion

The Social WEEE pilot represented an important step toward integrating social initiatives with the circular economy. Although the project encountered numerous barriers, it also provided valuable insights that can serve as a foundation for future initiatives. Key areas requiring further work include process standardization, capacity building for SEEs, improved communication, and the development of cooperation models based on real-world processes. Implementing the recommended actions could significantly increase adoption rates and ensure lasting social and environmental impacts in subsequent project phases

Key limitations include the absence of a legal basis for directly outsourcing waste-related activities to SEEs without public procurement procedures, restricted ability to finance strictly waste-related infrastructure, and the risk of exceeding county competencies by intervening in the WEEE market.

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WEEE AWARE PILOT SOLUTIONS

Experiences and Recommendations from the Implementation of Circular WEEEP

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WEEE AWARE Pilot Solutions

Experiences and Recommendations from the Implementation of Circular WEEEP

A. Introduction

The Circular WEEEP project addresses the growing challenge of waste electrical and electronic equipment (WEEE) by developing and testing solutions that support circular economy principles across Central Europe. As part of this initiative, the WEEE AWARE pilot action ("From the School to the City Hall") focuses on raising awareness, strengthening cooperation, and promoting responsible e-waste management through education and community engagement.

The pilot was implemented across multiple countries (Slovakia, Czech Republic, Slovenia) and connected activities at the level of schools andlocal authorities, combining awareness-raising with practical actions such as e-waste collection and stakeholder involvement. Based on the implementation experience and feedback from participating schools, coordinators, and project partners, the following section summarizes key experiences, lessons learned, and recommendations. These insights reflect both the achieved results and identified challenges and aim to support further improvement, scalability, and effective replication of the proposed solutions

The following sections present key findings from the pilot implementation, structured into lessons learned, identified challenges, and recommended improvements for future application and scaling of the WEEE AWARE solution.

Definition of Potential Large-Scale Solution for Transnational Application

Pilot results show strong potential for replication and scaling of the WEEE Aware model. We propose the following components for a transnational solution:

1. **Modular Approach**
   - Educational module for schools (adaptable to local curricula)
   - Community awareness module including local media and social media engagement
   - Institutional module targeting local governments and municipal commissions

2. **Partnership Model**
   - Establish local consortia including schools, NGOs, municipalities, and recycling partners
   - Involve national stakeholders (ministries, environmental agencies) to ensure long-term sustainability

3. **Digital Tools**
   - Use of platforms like EduPage (or equivalent) for communication and tracking progress
   - Development of shared online resources for educators and local stakeholder

4. **Monitoring and Impact Measurement**:
   - Unified methodology for data collection (amount of e-waste, engagement metrics, feedback)
   - Comparative evaluation across participating countries

5. **Scalability and Adaptability**:
   - Templates and toolkits translated and tailored for national contexts
   - Opportunity to include more countries and cities in future phases

Lessons learned

What we would do differently if implementing the pilots again

- **Provide ready-to-use educational materials from the start.**
  Schools requested worksheets, presentations, videos, and methodological guidance that can be easily integrated into lessons.
- **Deliver earlier and more structured teacher training.**
  Teachers lacked clarity on how and where to include the topic, as e-waste is not part of the curriculum.
- **Strengthen cooperation with recycling experts and organizations.**
  Guest speakers, ENVIDOM lectures, discussions, and site visits were among the most impactful activities.
- **Introduce unified monitoring tools from the beginning.**
  Standardised data collection would facilitate cross-country comparison.
- **Increase community-based activities**, such as electro-swap events and repair cafés, to expand the impact beyond schools.

Key points to watch out for to ensure smooth and effective implementation

- **Clear, visual, and user-friendly materials** for teachers and students.
- **Continuous communication with participating schools**, including guidance and troubleshooting.
- **Safety protocols** for practical dismantling or handling of devices.
- **Well-marked and visible e-waste collection points** at schools and institutions.
- **Cooperation with recycling companies**, both for logistics and educational content.
- **Community involvement** to enhance long-term behaviour change.
- **Linking awareness with practical experience**, such as school collection days.

What we plan to continue – approaches that have proven effective

- **Interactive, experiential learning.**
  Dismantling devices, creative workshops, videos, and class discussions were the most appreciated.
- **School e-waste collection campaigns integrated with education.**
  Students began sorting e-waste at home and involved their parents.
- **Expert-led lectures and workshops**, which improve understanding and credibility.
- **Use of digital platforms such as EduPage** to communicate, motivate, and share results.
- **Community engagement events** that help spread awareness beyond the school environment.

- **Modular structure** (schools – community – local government), which supports scalability and transnational transfer.

Practical findings and lessons already applied

- **General awareness of e-waste is very low** and requires foundational education.
- **Experiential learning generates the strongest educational impact.**
- **Schools highly value simple, ready-to-use tools**, given limited staff capacity.
- **Involving families significantly increases behavioural change.**
- **Partnerships with experts and recycling organizations are essential** for both logistics and professional content.
- **The pilot demonstrated strong scalability potential**, supported by digital tools and modular design.
- **The achieved results (1068 students, 377 schools, 3 countries)** confirm the effectiveness and transferability of the model.

B. Conclusion

The findings from the WEEE AWARE pilot implementation confirm that education and community engagement are effective tools for increasing awareness and promoting responsible e-waste management. The pilot demonstrated that combining awareness-raising activities with practical actions can lead to meaningful behavioural change and stronger cooperation among stakeholders.

The identified lessons and recommendations provide a solid basis for further improvement, replication, and scaling of the solution, contributing to the long-term development of circular economy practices in the field of WEEE.